Introduction to the Rarer Elements. By PHILIP E. BROWNING. Third edition, thoroughly revised. New York, John Wiley & Sons. 1912. Pp. xii + 232.

Our knowledge of the rarer elements has been considerably extended since 1908, when the second edition of "Browning" appeared.

While the general scheme of the work remains the same as in the two previous editions, the author has made many changes and additions throughout: for instance, the chapter on qualitative separation has been extended by including new analytical diagrams, working directions, and notes; the chapter on technical applications has been much improved by the addition of considerable material; and a table of spectroscopic lines and plates illustrating typical spectra have been added. The revision has been quite thoroughly done. For the first time the work has been well indexed; this improvement in itself greatly enhances the usefulness of the book.

Among the omissions may be noted the following: The test for the platinum metals (except osmium and ruthenium) devised by Curtman and Rothberg (this is the most delicate chemical test for platinum); and the conduct of the platinum metals toward various gases (Phillips, *Am. Phil. Soc.*, March 17, 1893).

It would be advisable in later editions to give the original references to the literature on technical applications, especially to the patents; and to include a complete bibliography of the treatises on the rarer elements, if any bibliography is given.

CHARLES BASKERVILLE

Light, Photometry and Illumination. A thoroughly revised edition of "Electrical Illuminating Engineering." By WILLIAM EDWARD BARROWS, Jr., B.S., E.E., Professor of Electrical Engineering, University of Maine. New York, McGraw-Hill Book Company. 1912. Pp. ix + 335.

Some of the science, and most of the art, of illumination is still in a decidedly unsettled state, and he who wishes to write a text-book on the subject has a narrow course to sail between the Scylla of obsolescent matter and the Charybdis of controversial discussion. Professor Barrows apparently has more fear of the first danger; at any rate, he has in several parts of his new text gone perilously near to the second. A considerable part of the book is made up of quotations and passages adapted from recent papers. As a résumé of important articles of the last few years the work is useful, and its value is augmented by the care which has been taken to give references to the original authorities. By copious use of quotations the author to some extent disarms criticism and shifts responsibility to the original authors, but for purposes of instruction the book would be more valuable if some of the lengthy quotations were replaced by a digested presentation of the problems to be met and the facts supposed to be established.

The treatment of radiation which serves as an introduction to the book is characterized by a looseness of expression which can not fail to produce hazy ideas in the mind of the student. As examples may be mentioned the statement that "at wave-lengths greater than those of red light the energy radiated is in the form of heat" (p. 1), and the naïve criticism of the bolometer because it "is apt to indicate the heat rays rather than the luminous rays" (p. 93).

Even more serious are certain misstatements of fact, *e. g.*, "since the radiation varies as the fourth power of the temperature, it is evident that the greatest efficiency of radiation will be obtained at the highest temperatures," and "it follows from the above that the efficiency of the source as an illuminant will vary greatly with the temperature" (p. 4). These statements precede any mention of the real cause of the increase in efficiency, that is, the shifting of the radiation toward shorter wavelengths with rise of temperature.

The discussion of the Luminous Equivalent of Radiation in Chapter III. is anything but clear. Its vagueness is due in part to the promiscuous use of terms without definitions,